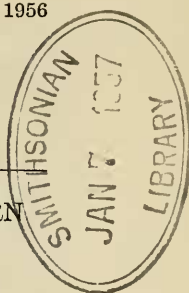


PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



A NEW POCKET MOUSE FROM SOUTHEASTERN
UTAH

BY STEPHEN D. DURRANT AND M. RAYMOND LEE

For several years we have been collecting specimens of pocket mice *Perognathus parvus* (Peale) from many localities in southeastern Utah, west of the Colorado River. When Durrant prepared his "Mammals of Utah, Taxonomy and Distribution," he listed (University of Kansas Publications, Museum of Natural History, 6:244, August 10, 1952) only three specimens of this species from this entire area. Furthermore, he stated (*op. cit.*:243), that owing to the paucity of specimens from this area, he was tentatively referring these three specimens to the subspecies *Perognathus parvus olivaceus*. In addition, he stated that additional specimens from this area might prove the existence there of an unnamed subspecies of pocket mice of the species *Perognathus parvus*. The specimens available from this area are now adequate to partially resolve this problem, and do substantiate the aforementioned suspicion of Durrant.

For the loan of comparative materials, we are indebted to Doctor John W. Aldrich and Miss Viola S. Schantz, United States National Museum, United States Fish and Wildlife Service, Washington, D. C., and Doctor Seth B. Benson, Museum of Vertebrate Zoology, University of California, Berkeley, California. We are further indebted to Doctor Seth B. Benson for his aid and advice in this study and also for studying these specimens.

Unless otherwise stated, all measurements are in millimeters. All capitalized color terms are after Ridgway (Color Standards and Color Nomenclature, Washington, D. C., 1912).

This study was financed by a grant from the National Science Foundation.

Perognathus parvus bullatus new subspecies

Type.—Male, adult, skin and skull, number 8771, Museum of Zoology, University of Utah, Salt Lake City, Utah; Ekker's Ranch, Robbers Roost, 25 miles [airline] east of Hanksville, 6,000 feet, Wayne County, Utah; May 18, 1951; collected by John Bushman; original number, 54.
Range.—Insofar as known, that area in southeastern Utah bounded by the San Rafael, Green, Colorado and Fremont rivers.

Diagnosis.—*Size*: Small (see measurements). *Color*: Upper parts and dorsal surface of tail, Light Pinkish Cinnamon or Light Ochraceous Buff, moderately overlaid with black-tipped hairs; cheeks, sides, flanks and circumorbital area pure Light Pinkish Cinnamon or Light Ochraceous Buff; postauricular patches whitish; arietiform markings but slightly darker than surrounding pelage; underparts, feet and ventral surface of tail, white. *Skull*: Short; mastoidal region markedly inflated; mastoidal bullae actually as well as relatively extremely enlarged; auditory bullae large; interparietal small, especially in width; line of union between supraoccipital and mastoidal bullae straight (usually irregular in other subspecies); mastoidal bullae project markedly posteriorly beyond occiput; nasals markedly short; width across maxillary plates of zygomata decidedly narrow relative to mastoidal breadth; infra-orbital foramina small with long axis directed anterodorsad-posteroventrad; incisors weak and strongly recurved.

Measurements.—Average and extreme measurements of 14 adult male and 5 adult female topotypes are, respectively, as follows: Total length, 161.8 (175.0-151.0), 157.8 (175.0-148.0); length of tail, 86.3 (95.0-77.0), 84.8 (94.0-74.0); length of hind foot, 20.7 (23.0-17.0), 20.3 (22.0-17.0). *Skull*: Average and extreme cranial measurements of 8 adult male and 5 adult female topotypes are, respectively, as follows: Greatest length, 26.0 (26.5-25.4), 24.9 (25.6-24.4); occipitonasal length, 25.6 (25.9-25.1), 24.7 (25.1-24.3); length of nasals, 9.2 (10.0-9.0), 9.0 (9.1-8.8); zygomatic breadth, 11.9 (12.1-11.6), 11.7 (11.9-11.4); mastoidal breadth, 13.6 (13.9-13.2), 13.1 (13.5-12.7); least interorbital breadth, 5.9 (6.0-5.7), 5.8 (6.1-5.6); width of interparietal, 4.0 (4.3-3.5), 4.1 (4.4-3.9); length of interparietal, 3.1 (3.5-2.8), 3.1 (3.4-2.6); width of auditory bulla (from median line to external auditory meatus), 7.2 (7.5-6.9), 7.0 (7.2-6.8); length of mastoidal bullae, 9.9 (10.1-9.7), 9.4 (9.7-9.2); depth of braincase over bullae, 9.1 (9.2-9.0), 9.0 (9.2-8.7); alveolar length of upper molariform tooth-row 3.7 (3.9-3.5), 3.5 (3.7-3.4).

Comparisons.—We examined topotypes and other specimens belonging to each of the three subspecies *Perognathus parvus obliviaceus*, *Perognathus parvus clarus* and *Perognathus parvus trumbullensis*. All specimens assigned to *Perognathus parvus bullatus* can be readily distinguished from members of the three aforementioned subspecies by: Nasals shorter; interparietal markedly narrower; auditory and mastoidal bullae actually as well as relatively decidedly larger; ratio of width of anterior part of zygomata to mastoidal breadth 0.88 as opposed to 1.0; bullar index (length of mastoidal bulla X mastoid breadth minus width of interparietal divided by 10), statistically significantly larger.

In addition to the above salient characters, topotypes of *P. p. bullatus* differ from near topotypes of *P. p. olivaceus* as follows: *Size*: Total length less; tail longer relative to total length; hind foot averages smaller. *Color*: Redder, less blackish in upper parts. *Skull*: Mastoidal bullae project caudad of occiput as opposed to non projecting; interparietal shorter.

In a similar manner, topotypes of *P. p. bullatus* are further unlike those of *P. p. clarus* in: *Color*: Redder, upper parts rosaceous as opposed to grayish. *Skull*: Width of auditory bullae greater; depth of combined bullae greater; width across external auditory meatuses greater.

Although markedly distinctive, topotypes of *P. p. bullatus* resemble those of *P. p. trumbullensis* more closely than those of any other subspecies, but differ from them in addition to the above mentioned characters as follows: *Size*: Total length less; hind feet shorter; ears smaller. *Color*: Markedly lighter; lateral line less distinctive; underparts white as opposed to ochraceous buff in most specimens; hairs of venter white basally as opposed to plumbeous in some specimens. *Skull*: Shorter; depth of bullae greater; mastoidal bullae project farther caudad beyond occiput.

Remarks.—We have studied the pocket mice (*Perognathus parvus*) from this entire area of eastern Utah for the past six years, and have series of specimens from numerous localities. The specimens from each locality are quite uniform in their characters, but a wide range of variation exists between series from different localities. This makes for an exceedingly complex situation. We are, at present, in the process of preparing a larger paper on the whole complex of these animals from this general region. To date, we have considerable information on amounts of variation, types of intergradation and rates of subspeciation.

Members of the subspecies *P. p. bullatus* are one hundred per cent diagnostic in their characters. This is not a case of applying any percentage rule in setting off a population as a subspecies, because all members of all ages studied are readily recognizable and easily differentiated. This is the most diagnostic and clearly discernable population known to us within the entire species *P. parvus*. We long considered that these animals constituted a new, undescribed species, but our studies, as of now, lead us to conclude that although they do not as yet constitute a new species, they do represent a kind that is well along on its way to becoming a new species. This subspecies while being widely divergent morphologically from all others has not as yet attained complete reproductive isolation. This is indicated in three specimens from Buckhorn Wash on the San Rafael River. These specimens are highly variable, and have much higher coefficients of variation than do animals of other populations within the species. This degree of variation is typical of animals from areas of secondary intergradation. While these three animals are referable to *P. p. bullatus*, the nature and extent of this variation indicates that interbreeding with members of other populations is still occurring, and hence reproductive isolation has not yet been achieved in all members of *P. p. bullatus*.

The known range of the subspecies *P. p. bullatus* is small, and this subspecies would be considered by some to be only a microgeographic race, and therefore, should not merit being given a formal trinomial name. Among others, we have long championed the point of view that the size of the range should be no criterion for applying or not applying formal taxonomic designations to populations of animals. We consider that the differences in the animals themselves which bespeak of a different genetic constitution, and the degrees of difference should be the determining factors. We submit that the great differences demonstrated by the members of *P. p. bullatus* are evidences in support of our contention. In answer to our critics, we have before us animals from a small geographic area, that are remarkably constant in their characters, are

highly differentiated from all others within the species, and are on the verge of becoming a new species.

Specimens examined.—Total number, 29, distributed as follows: *Emery County*: 1 mi. S San Rafael River, from Buckhorn Wash, 5,200 ft., 3; Old Woman Wash, 23 mi. N Hanksville, 5,200 ft., 4. *Wayne County*: Type locality, 22.

Contribution from the Department of Zoology, University of Utah, Salt Lake City, Utah.